



CITY OF KNOXVILLE  
INDYA KINCANNON, MAYOR

# Magnolia Avenue/ Rutledge Pike/ Asheville Highway Interchange Study

TDOT Project Update  
Tuesday September 8, 2020

By:



Gresham Smith





# Today's Agenda

Introduction

Cost

Design Concepts

Life Cycle Cost

LOS Analysis

Interim Improvements

Predictive Crash Analysis

Next Steps



# Introduction

Multiple studies since 2009 by:

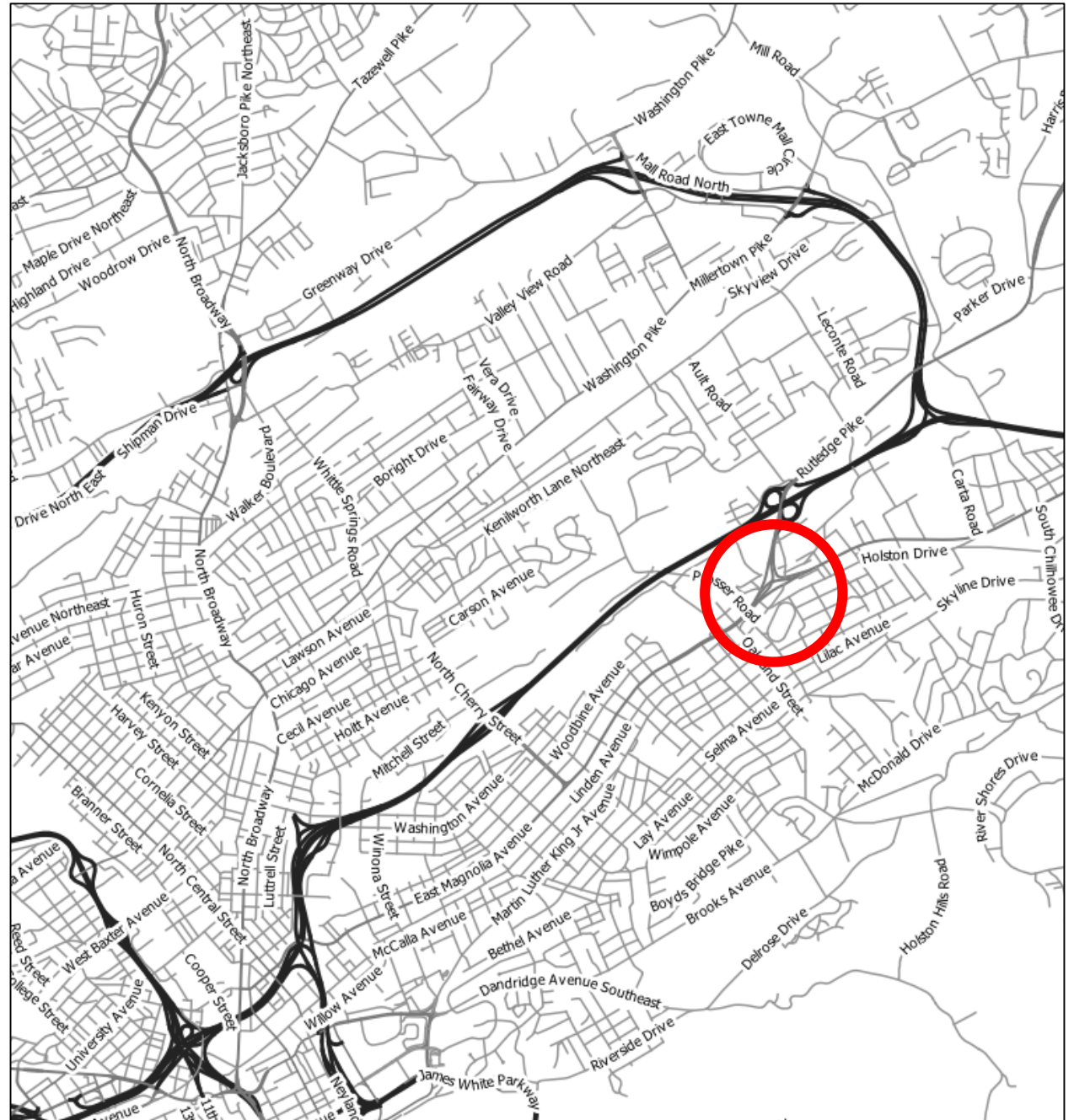
- Knoxville TPO,
- City of Knoxville,
- Private developers

All promote an intersection that compliments an urban, walkable neighborhood

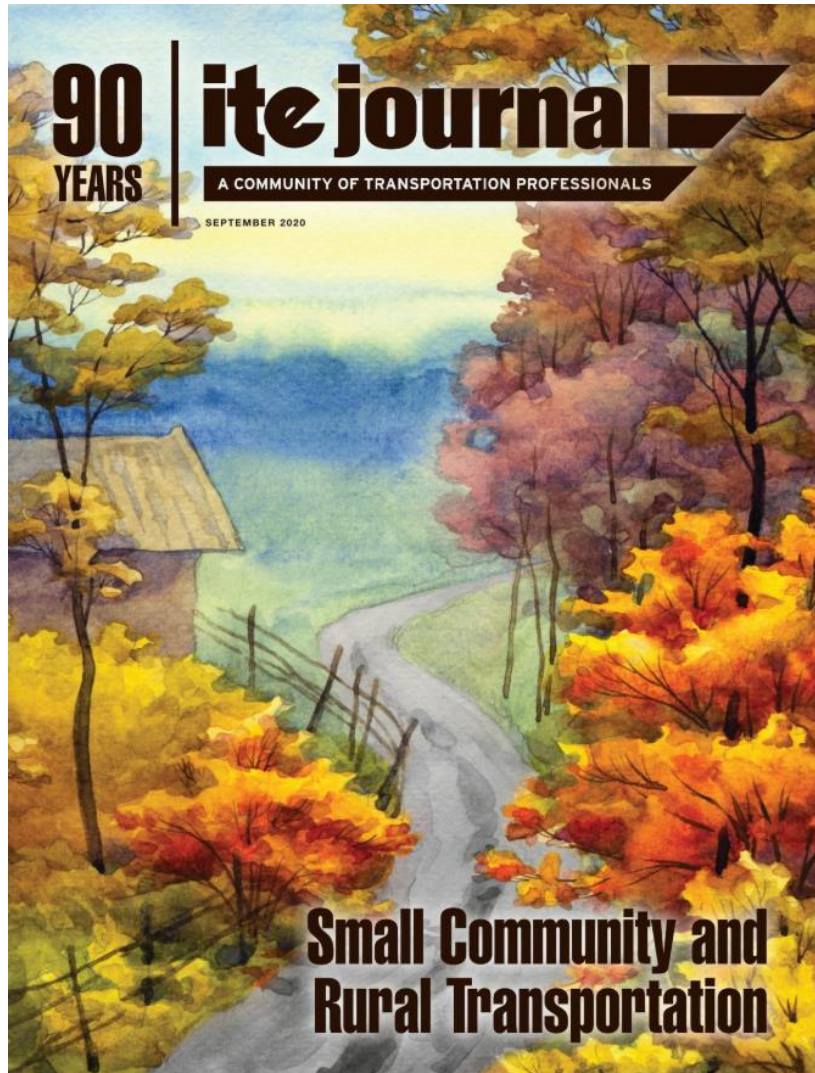
The existing interchange is out of context with its surroundings

It bisects the Burlington Neighborhood

It makes southbound-eastbound movement challenging



# Magnolia Avenue Improvements



## KNOXVILLE, TN, USA

### Magnolia Avenue Streetscapes

Across several **Knoxville, TN, USA** mayoral administrations, revitalization efforts were established for East Knoxville's Magnolia Avenue Corridor. Public engagement was initiated in 2009 and rebooted again, resulting in the city making a \$7 million public investment for streetscape improvements on a model block section in hopes to trigger reinvestment and improve the quality of life for area residents.



Magnolia Avenue, state highway (US 11W) is situated in a predominately African American community east of the city's downtown core. The area is an important gateway linking downtown Knoxville to several adjacent and (most importantly) engaged citizens in the Parkridge, Chilhowee, and Burlington communities.

Presently a complete street, Magnolia Avenue accommodates all transportation users: pedestrians, bicyclists, motorists, and transit riders. However, these new improvements (landscaped center medians, stamped crosswalks, traffic and pedestrian signal upgrades, street trees, wider sidewalks, buffered bike lanes, benches, and bus shelters) now provide a safer and more accessible street network for both neighborhood residents and visitors to the area.



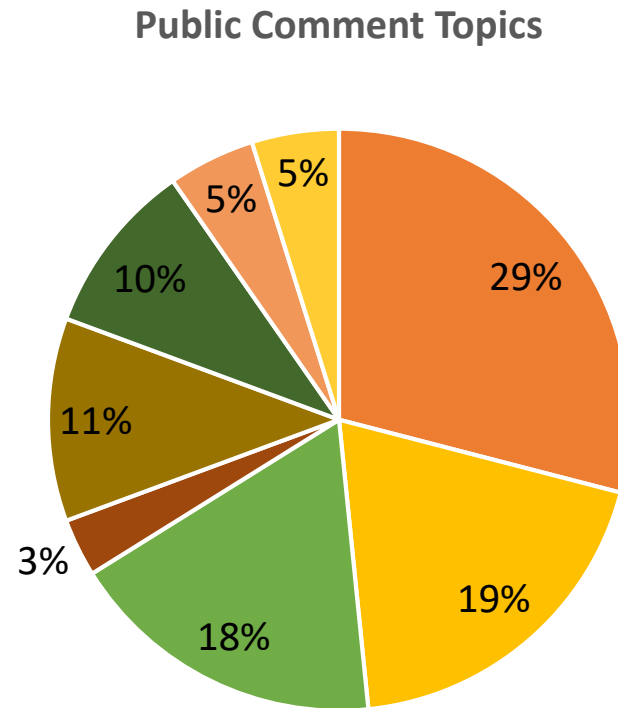


# Introduction





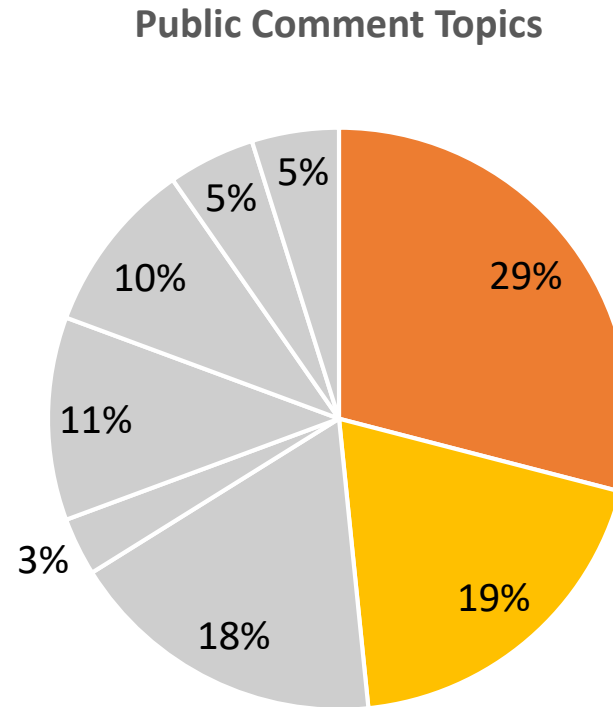
# Introduction – Public Meeting 10/30/19



■ Traffic Control ■ Connectivity ■ Bike/ Ped ■ Transit ■ Safety ■ Comm. Input ■ Enhancements ■ ROW Use



# Introduction – Public Meeting 10/30/19

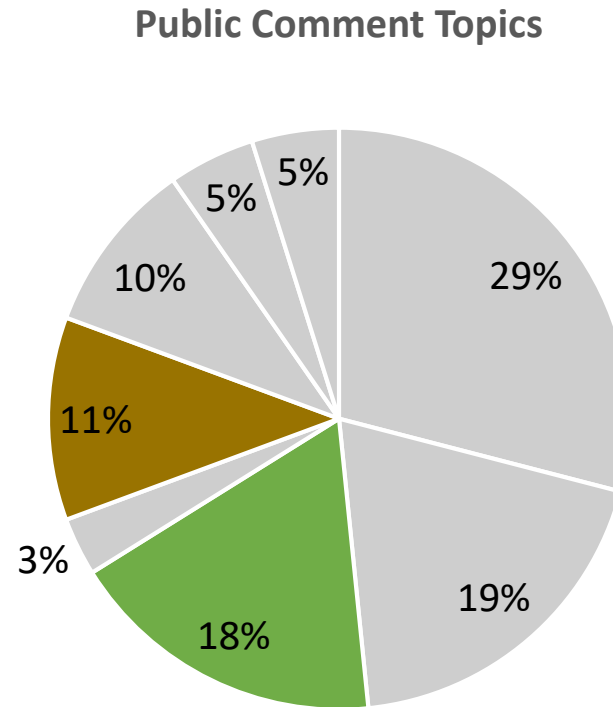


**48% of Responses  
were related to  
Traffic Control or  
Connectivity**

■ Traffic Control ■ Connectivity ■ Bike/ Ped ■ Transit ■ Safety ■ Comm. Input ■ Enhancements ■ ROW Use



# Introduction – Public Meeting 10/30/19



**29% of Responses  
were related to  
Safety /  
Multimodal**

■ Traffic Control ■ Connectivity ■ Bike/ Ped ■ Transit ■ Safety ■ Comm. Input ■ Enhancements ■ ROW Use





# Introduction – Stakeholder Input

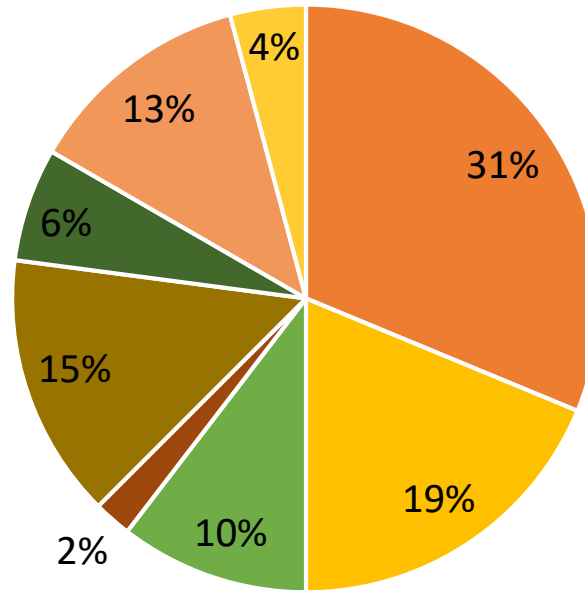
| Group   | Agencies Represented  | Location, Date and Time                 |
|---|---|---|
| City of Knoxville Alternative Transportation and TDOT | TDOT Strategic Transportation Investments Division, TDOT Region 1 Traffic, Knox County Schools, Knoxville Area Transit, Knoxville Area TPO                                    | City County Building, 1/29/20, 11:00 AM |
| Elected Officials                                     | Knoxville City Council, Knox County School Board  | City County Building, 1/29/20, 2:30 PM  |
| Neighborhood Associations                             | Neighborhood Associations   | Perk City, 1/29/20, 5:30 PM             |
| City Staff  | Knoxville Fire Department, Police Department, Parks and Recreation, Community Development, Traffic Engineering, Housing and Neighborhood Development                          | City County Building, 2/3/20, 2:00 PM   |
| Architects  | East Tennessee Community Design Center  | Perk City, 2/4/20, 9:00 AM              |
| Business Representatives                              | Tennessee Valley Fair, Chilhowee Park (ASM Knoxville), Muse Knoxville, Knoxville Golden Gloves, Zoo Knoxville, Burlington Neighborhood Association, Knoxville ADA Coordinator | Perk City, 2/11/20, 1:30 PM             |





# Introduction – Stakeholder Input

Stakeholder Meetings Comment Topics



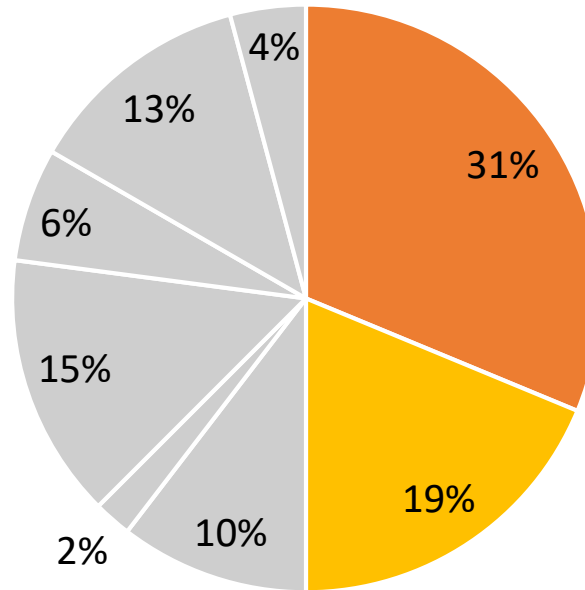
■ Traffic Control ■ Connectivity ■ Bike/ Ped ■ Transit ■ Safety ■ Comm. Input ■ Enhancements ■ ROW Use





# Introduction – Stakeholder Input

Stakeholder Meetings Comment Topics



**50% of Responses  
were related to  
Traffic Control or  
Connectivity**

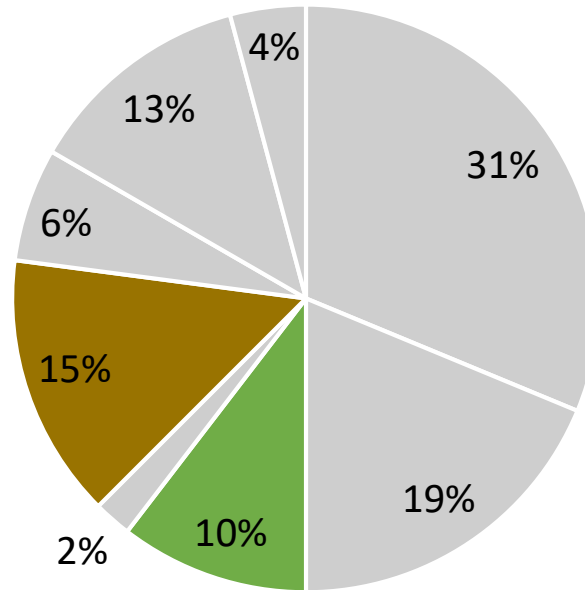
■ Traffic Control ■ Connectivity ■ Bike/ Ped ■ Transit ■ Safety ■ Comm. Input ■ Enhancements ■ ROW Use





# Introduction – Stakeholder Input

Stakeholder Meetings Comment Topics



**25% of Responses  
were related to  
Safety /  
Multimodal**

■ Traffic Control ■ Connectivity ■ Bike/ Ped ■ Transit ■ Safety ■ Comm. Input ■ Enhancements ■ ROW Use



# Design Concepts

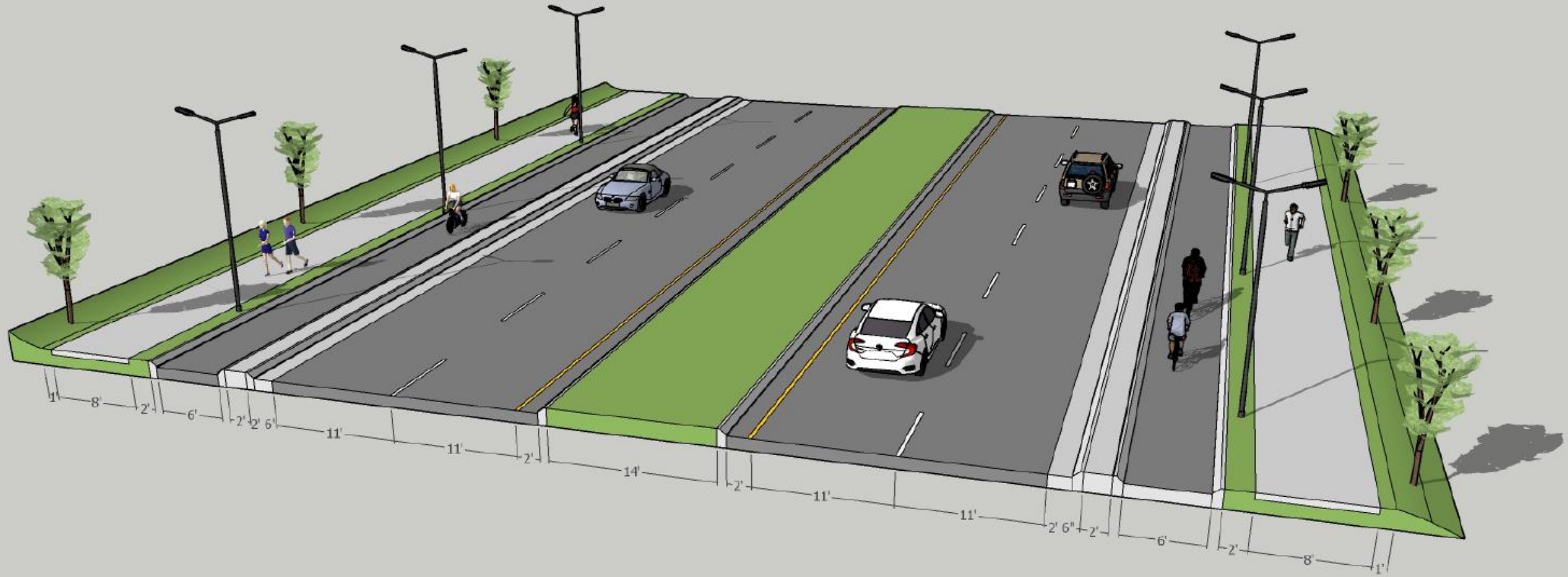
## Two Options Under Consideration

- Signalized “Protected” Intersection
- Multilane Roundabout





# Design Concepts – Typical Section



# Improvements with Two Concepts

## Signalized Intersection and Multilane Roundabout



Improved Connection between Rutledge Pike and Asheville Highway



Community-Desired Connection to Burlington Commercial District



Improved Access Management



Protected Bike Lanes



Improved Sidewalks





# Design Concepts – Protected Intersection

Relatively new design

A number of features make this intersection safer

- Corner refuge islands
- Setback crossing of the pedestrians and cyclists

Example Salt Lake City

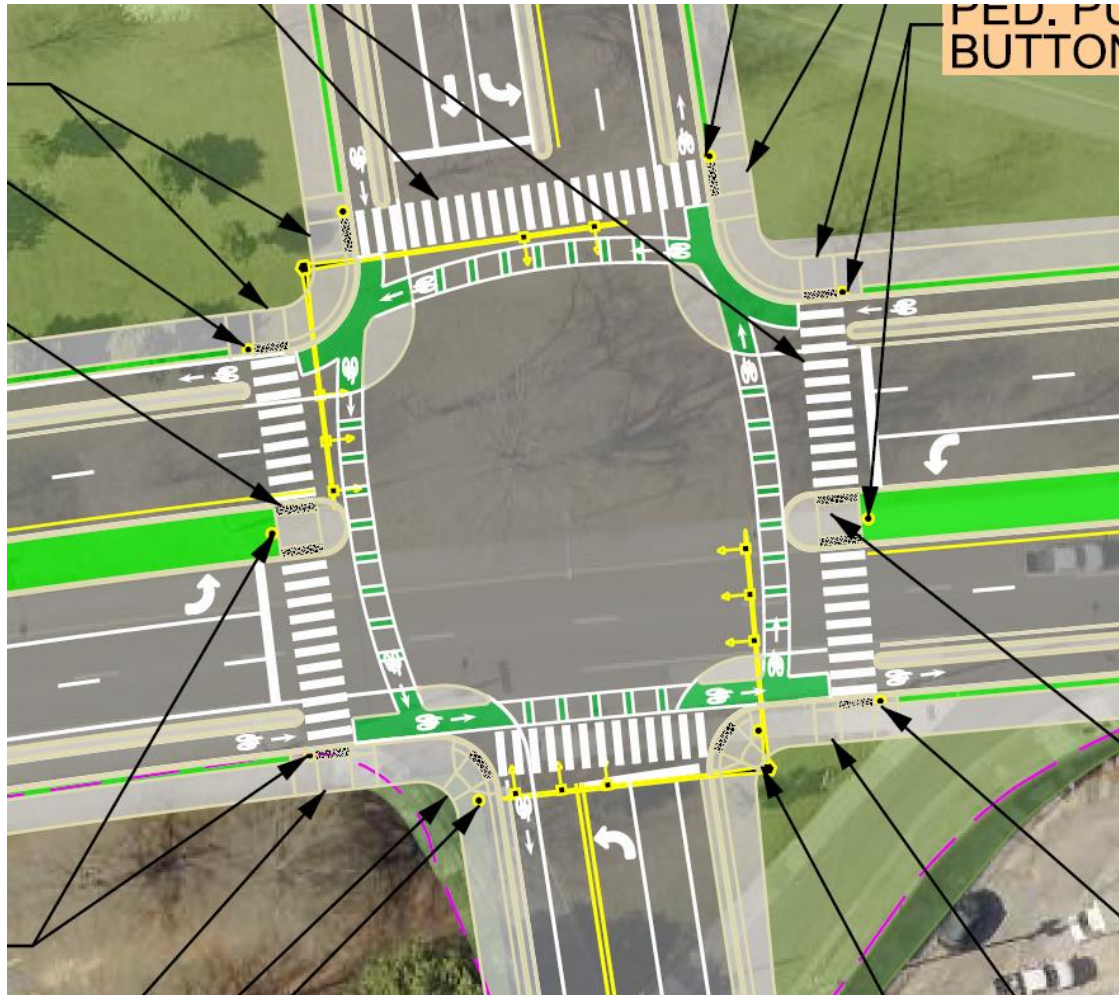








# Design Concepts – Protected Intersection









# Design Concepts

May need to implement design features such as color-contrasting truck aprons to achieve competing goals of tight radii and truck and fire vehicle accommodation



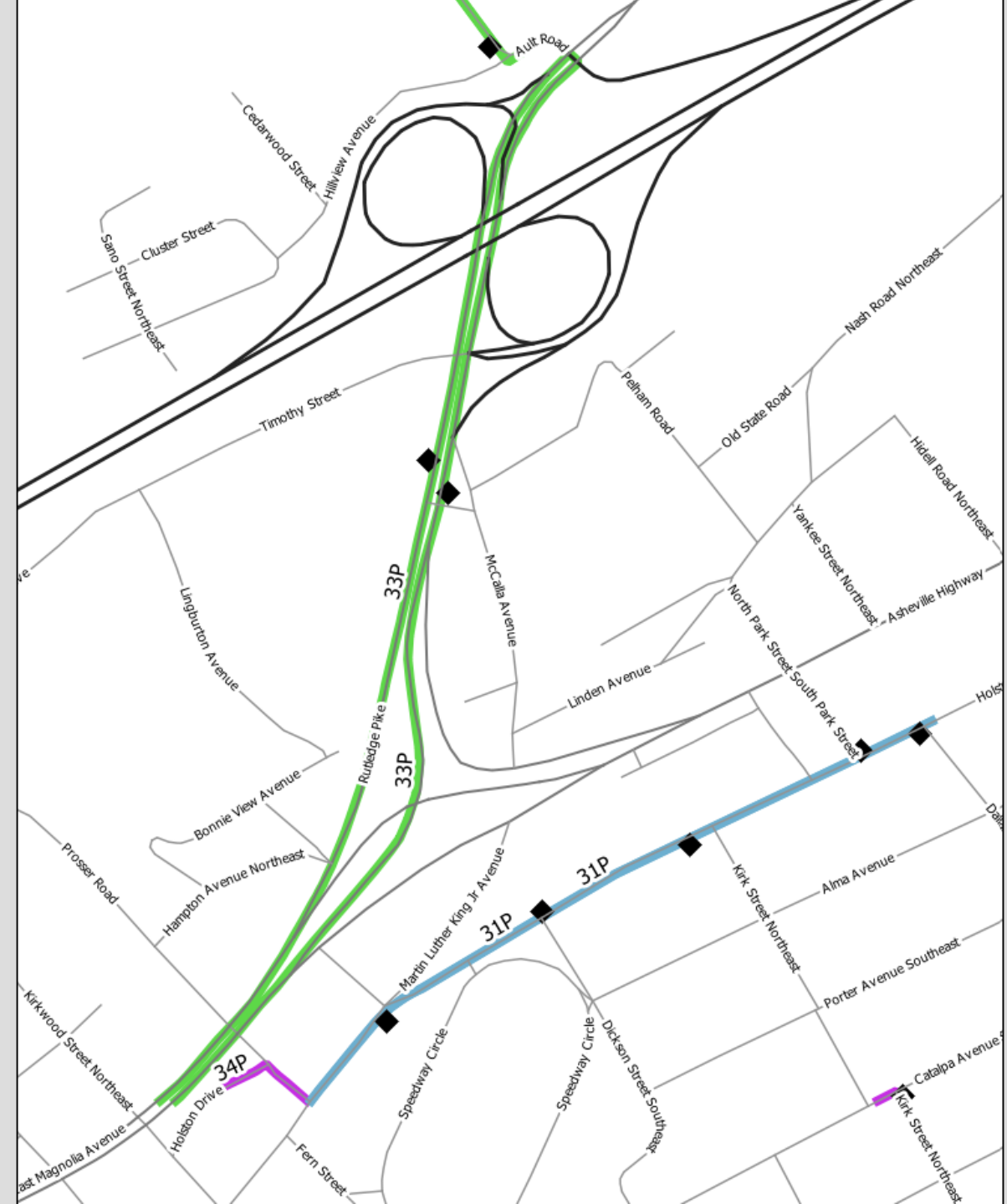


# Bus Stop Discussion with Both Concepts

Currently no bus stops along Magnolia Avenue / Asheville Highway

Protected bike lanes would interfere with ADA-compliant stops

Would need to remove curb barrier and allow bus to stop in bike lane to access the sidewalk



# LOS Analysis – Existing Geometry


| 2025 |                                       |        | AM                   |       |         |              |    |    |    | PM                   |       |         |              |    |    |    |
|------|---------------------------------------|--------|----------------------|-------|---------|--------------|----|----|----|----------------------|-------|---------|--------------|----|----|----|
|      |                                       |        | Overall Intersection |       |         | Approach LOS |    |    |    | Overall Intersection |       |         | Approach LOS |    |    |    |
| ID   | Intersection                          | Type   | LOS                  | Delay | Max v/c | EB           | WB | NB | SB | LOS                  | Delay | Max v/c | EB           | WB | NB | SB |
| 1    | Magnolia Ave. (SR 1) at Beaman St.    | Signal | A                    | 3.0   | 0.20    | A            | A  | D  | D  | A                    | 5.0   | 0.40    | A            | A  | D  | D  |
| 2    | Magnolia Ave. (SR 1) at Lakeside St.  | Signal | A                    | 2.6   | 0.20    | A            | A  | C  | C  | A                    | 4.0   | 0.26    | A            | A  | C  | C  |
| 3    | Magnolia Ave. (SR 1) at Kirkwood St.  | Signal | A                    | 3.4   | 0.24    | A            | A  | C  | C  | A                    | 3.7   | 0.28    | A            | A  | C  | C  |
| 4    | Magnolia Ave. (SR 1) at Prosser Rd.   | Signal | B                    | 10.2  | 0.37    | A            | A  | C  | C  | A                    | 8.4   | 0.35    | A            | A  | C  | C  |
| 5    | Magnolia Ave. (SR 1) at McCalla Ave.  | TWSC   | -                    | 1.7   | -       | -            | -  | A  | -  | -                    | 1.5   | -       | -            | -  | B  | -  |
| 6    | Asheville Hwy. (SR 168) at Park St.   | TWSC   | -                    | 2.6   | -       | -            | -  | B  | C  | -                    | 7.9   | -       | -            | -  | C  | F  |
| 7    | Rutledge Pike (SR 1) at I-40 EB Ramps | Signal | D                    | 40.7  | 0.90    | D            | E  | C  | B  | B                    | 13.9  | 0.48    | C            | C  | B  | B  |
| 8    | Rutledge Pike (SR 1) at McCalla Ave.  | TWSC   | -                    | 1.4   | -       | -            | B  | -  | A  | -                    | 1.7   | -       | -            | C  | -  | A  |

Note: Signal is signalized intersection; TWSC is Two-Way Stop Sign Control

| 2045 |                                       |        | AM                   |       |         |              |    |    |    | PM                   |       |         |              |    |    |    |
|------|---------------------------------------|--------|----------------------|-------|---------|--------------|----|----|----|----------------------|-------|---------|--------------|----|----|----|
|      |                                       |        | Overall Intersection |       |         | Approach LOS |    |    |    | Overall Intersection |       |         | Approach LOS |    |    |    |
| ID   | Intersection                          | Type   | LOS                  | Delay | Max v/c | EB           | WB | NB | SB | LOS                  | Delay | Max v/c | EB           | WB | NB | SB |
| 1    | Magnolia Ave. (SR 1) at Beaman St.    | Signal | A                    | 3.3   | 0.27    | A            | A  | D  | D  | A                    | 5.7   | 0.47    | A            | A  | D  | D  |
| 2    | Magnolia Ave. (SR 1) at Lakeside St.  | Signal | A                    | 2.4   | 0.25    | A            | A  | D  | D  | A                    | 3.6   | 0.36    | A            | A  | D  | D  |
| 3    | Magnolia Ave. (SR 1) at Kirkwood St.  | Signal | A                    | 4.5   | 0.33    | A            | A  | D  | D  | A                    | 4.7   | 0.39    | A            | A  | D  | D  |
| 4    | Magnolia Ave. (SR 1) at Prosser Rd.   | Signal | B                    | 12.5  | 0.48    | A            | A  | C  | D  | A                    | 9.9   | 0.43    | A            | A  | D  | D  |
| 5    | Magnolia Ave. (SR 1) at McCalla Ave.  | TWSC   | -                    | 1.7   | -       | -            | -  | A  | -  | -                    | 1.6   | -       | -            | -  | B  | -  |
| 6    | Asheville Hwy. (SR 168) at Park St.   | TWSC   | -                    | 3.5   | -       | -            | -  | C  | D  | -                    | 42.9  | -       | -            | -  | F  | F  |
| 7    | Rutledge Pike (SR 1) at I-40 EB Ramps | Signal | E                    | 57.3  | 0.99    | F            | F  | D  | C  | B                    | 17.9  | 0.62    | D            | D  | B  | A  |
| 8    | Rutledge Pike (SR 1) at McCalla Ave.  | TWSC   | -                    | 1.4   | -       | -            | C  | -  | A  | -                    | 2.1   | -       | -            | D  | -  | A  |

# LOS Analysis – Proposed Geometry – Both Operate at LOS B in Design Year

| 2025 |  |        | AM                   |       |         |              |    |    | PM                   |     |       |              |    |    |    |    |
|------|--|--------|----------------------|-------|---------|--------------|----|----|----------------------|-----|-------|--------------|----|----|----|----|
|      |  |        | Overall Intersection |       |         | Approach LOS |    |    | Overall Intersection |     |       | Approach LOS |    |    |    |    |
| ID   | Intersection                           | Type   | LOS                  | Delay | Max v/c | EB           | WB | NB | SB                   | LOS | Delay | Max v/c      | EB | WB | NB | SB |
| 1    | Magnolia Ave. (SR 1) at Beaman St.     | Signal | A                    | 3.0   | 0.20    | A            | A  | D  | D                    | A   | 5.0   | 0.40         | A  | A  | D  | D  |
| 2    | Magnolia Ave. (SR 1) at Lakeside St.   | Signal | A                    | 2.6   | 0.20    | A            | A  | C  | C                    | A   | 4.0   | 0.26         | A  | A  | C  | C  |
| 3    | Magnolia Ave. (SR 1) at Kirkwood St.   | Signal | A                    | 4.5   | 0.24    | A            | A  | C  | C                    | A   | 4.4   | 0.28         | A  | A  | C  | C  |
| 4    | Magnolia Ave. (SR 1) at Prosser Rd.    | Signal | B                    | 10.3  | 0.37    | A            | A  | C  | C                    | A   | 8.3   | 0.33         | A  | A  | C  | C  |
| 5    | Magnolia Ave. (SR 1) at Rutledge Pike  | Signal | B                    | 14.0  | 0.44    | B            | B  | B  | B                    | B   | 14.6  | 0.63         | A  | B  | C  | C  |
| 5    | Magnolia Ave. (SR 1) at Rutledge Pike  | Round. | A                    | 7.5   | 0.46    | A            | A  | A  | B                    | A   | 8.8   | 0.71         | A  | A  | B  | A  |
| 6    | Asheville Hwy. (SR 168) at Park St.    | TWSC   | -                    | 1.7   | -       | -            | -  | B  | C                    | -   | 3.9   | -            | -  | -  | C  | E  |
| 7    | Rutledge Pike (SR 1) at I-40 EB Ramps  | Signal | D                    | 40.7  | 0.90    | D            | E  | C  | B                    | B   | 13.9  | 0.48         | C  | C  | B  | B  |
| 8    | Rutledge Pike (SR 1) at McCalla Ave.   | TWSC   | -                    | 0.4   | -       | -            | A  | -  | A                    | -   | 0.8   | -            | -  | C  | -  | A  |
| 9    | New Connector Rd. at Holston Dr. / MLK | AWSC   | A                    | 8.1   | -       | A            | A  | A  | A                    | A   | 8.8   | -            | A  | A  | A  | A  |

 : Improvement Option (Signal = Signalized Intersection; Round. = Multilane Roundabout; AWSC = All-Way Stop Sign Control)

| 2045 |  |        | AM                   |       |         |              |    |    |    | PM                   |       |         |              |    |    |    |
|------|--|--------|----------------------|-------|---------|--------------|----|----|----|----------------------|-------|---------|--------------|----|----|----|
|      |  |        | Overall Intersection |       |         | Approach LOS |    |    |    | Overall Intersection |       |         | Approach LOS |    |    |    |
| ID   | Intersection                           | Type   | LOS                  | Delay | Max v/c | EB           | WB | NB | SB | LOS                  | Delay | Max v/c | EB           | WB | NB | SB |
| 1    | Magnolia Ave. (SR 1) at Beaman St.     | Signal | A                    | 3.3   | 0.27    | A            | A  | D  | D  | A                    | 5.7   | 0.47    | A            | A  | D  | D  |
| 2    | Magnolia Ave. (SR 1) at Lakeside St.   | Signal | A                    | 2.4   | 0.25    | A            | A  | D  | D  | A                    | 3.6   | 0.36    | A            | A  | D  | D  |
| 3    | Magnolia Ave. (SR 1) at Kirkwood St.   | Signal | A                    | 5.6   | 0.33    | A            | A  | D  | D  | A                    | 5.5   | 0.39    | A            | A  | D  | D  |
| 4    | Magnolia Ave. (SR 1) at Prosser Rd.    | Signal | B                    | 12.7  | 0.48    | A            | A  | C  | D  | A                    | 9.9   | 0.40    | A            | A  | D  | D  |
| 5    | Magnolia Ave. (SR 1) at Rutledge Pike  | Signal | B                    | 15.7  | 0.55    | B            | B  | B  | C  | B                    | 18.7  | 0.84    | B            | C  | C  | C  |
| 5    | Magnolia Ave. (SR 1) at Rutledge Pike  | Round. | B                    | 10.4  | 0.64    | A            | A  | A  | C  | B                    | 12.6  | 0.96    | B            | B  | C  | B  |
| 6    | Asheville Hwy. (SR 168) at Park St.    | TWSC   | -                    | 2.2   | -       | -            | -  | C  | C  | -                    | 12.7  | -       | -            | -  | E  | F  |
| 7    | Rutledge Pike (SR 1) at I-40 EB Ramps  | Signal | E                    | 57.3  | 0.99    | F            | F  | D  | C  | B                    | 17.9  | 0.62    | D            | D  | B  | A  |
| 8    | Rutledge Pike (SR 1) at McCalla Ave.   | TWSC   | -                    | 0.4   | -       | -            | C  | -  | A  | -                    | 0.9   | -       | -            | C  | -  | A  |
| 9    | New Connector Rd. at Holston Dr. / MLK | AWSC   | A                    | 8.6   | -       | A            | A  | A  | A  | A                    | 9.9   | -       | B            | A  | A  | A  |




# Predictive Crash Analysis – FHWA SPICE Tool


| Safety Performance for Intersection Control Evaluation Tool |                                   |              |             |                          |                                |
|---|-----------------------------------|--------------|-------------|--------------------------|--------------------------------|
| Results   |                                   |              |             |                          |                                |
| Summary of crash prediction results for each alternative    |                                   |              |             |                          |                                |
| Project Information   |                                   |              |             |                          |                                |
| Project Name:   | Magnolia Ave. Interchange Study   |              |             | Intersection Type        | At-Grade Intersections         |
| Intersection:   | Magnolia Ave. at Rutledge Pike    |              |             | Opening Year             | 2025                           |
| Agency:   | City of Knoxville / Gresham Smith |              |             | Design Year              | 2045                           |
| Project Reference:  | 44321                             |              |             | Facility Type            | On Urban and Suburban Arterial |
| City:   | Knoxville                         |              |             | Number of Legs           | 4-leg                          |
| State:  | TN                                |              |             |                          |                                |
| Date:   | 7/11/2020                         |              |             |                          |                                |
| Analyst:  | JHS                               |              |             |                          |                                |
| Crash Prediction Summary                                    |                                   |              |             |                          |                                |
| Control Strategy  | Crash Type                        | Opening Year | Design Year | Total Project Life Cycle | AADT Within Prediction Range?  |
| 2-lane Roundabout   | Total                             | 1.79         | 2.34        | 43.36                    | N/A                            |
|   | Fatal & Injury                    | 0.29         | 0.39        | 7.15                     |                                |
| Traffic Signal  | Total                             | 2.32         | 3.19        | 57.73                    | Yes                            |
|   | Fatal & Injury                    | 0.85         | 1.16        | 21.12                    |                                |

Note: Predictive crash analysis for auto mode only



# Cost –Signal 84% cost of Roundabout (\$10.3 M vs. 12.2 M)

| Route:   | US 11   |       |         |               |
|--|---|-------|---------|---------------|
| Description:   | Magnolia Avenue / Rutledge Pike / Asheville Hwy Interchange |       |         |               |
|  |   |       |         |               |
| Project Type of Work:  | Intersection Improvements and Signals                       |       |         |               |
| County:  | Knox  |       |         |               |
| Length:  | 0.69 Miles  |       |         |               |
| Date:  | July 1, 2020  |       |         |               |
| Estimate Type:   | Concept   |       |         |               |
|  |   |       |         |               |
| DESCRIPTION  | LOCAL   | STATE | FEDERAL | TOTAL         |
|  | 0%  | 0%    | 0%      |               |
| <b>Construction Items</b>  |   |       |         |               |
| Removal Items  | \$0   | \$0   | \$0     | \$1,070,000   |
| Asphalt Paving   | \$0   | \$0   | \$0     | \$1,530,000   |
| Concrete Pavement  | \$0   | \$0   | \$0     | \$0           |
| Drainage   | \$0   | \$0   | \$0     | \$532,000     |
| Appurtenances  | \$0   | \$0   | \$0     | \$588,000     |
| Structures   | \$0   | \$0   | \$0     | \$81,600      |
| Fencing  | \$0   | \$0   | \$0     | \$0           |
| Signalization & Lighting   | \$0   | \$0   | \$0     | \$250,000     |
| Railroad Crossing  | \$0   | \$0   | \$0     | \$0           |
| Earthwork  | \$0   | \$0   | \$0     | \$1,300,000   |
| Clearing and Grubbing  | \$0   | \$0   | \$0     | \$0           |
| Seeding & Sodding  | \$0   | \$0   | \$0     | \$11,200      |
| Rip-Rap or Slope Protection  | \$0   | \$0   | \$0     | \$0           |
| Guardrail  | \$0   | \$0   | \$0     | \$47,900      |
| Signing  | \$0   | \$0   | \$0     | \$5,400       |
| Pavement Markings  | \$0   | \$0   | \$0     | \$13,600      |
| Maintenance of Traffic   | \$0   | \$0   | \$0     | \$108,000     |
| Mobilization 5%  | \$0   | \$0   | \$0     | \$277,000     |
| Other Items 10%  | \$0   | \$0   | \$0     | \$581,000     |
| Const. Contingency 30%   | \$0   | \$0   | \$0     | \$1,890,000   |
| Const. Eng. & Inspec. 10%  | \$0   | \$0   | \$0     | \$829,000     |
| Construction Estimate  | \$0   | \$0   | \$0     | \$9,110,000   |
| <b>Interchanges &amp; Unique Intersections</b>                                     |   |       |         |               |
| Roundabouts  | \$0   | \$0   | \$0     | \$0           |
| Interchanges   | \$0   | \$0   | \$0     | \$0           |
| <b>Right-of-Way &amp; Utilities</b>  | LOCAL   | STATE | FEDERAL | TOTAL         |
|  | 0%  | 0%    | 0%      |               |
| Right-of-Way   | \$0   | \$0   | \$0     | \$313,000     |
| Utilities  | \$0   | \$0   | \$0     | \$0           |
| <b>Preliminary &amp; Construction Engineering and Inspection</b>                   |   |       |         |               |
| Prelim. Eng. 10%   | \$0   | \$0   | \$0     | \$911,000     |
| <b>Total Project Cost (2018)</b>   | \$0   | \$0   | \$0     | \$ 10,300,000 |

| Route:  | US 11   |       |         |  |
|---|---|-------|---------|---|
| Description:  | Magnolia Avenue / Rutledge Pike / Asheville Hwy Interchange |       |         |   |
| Project Type of Work:                                 | Roundabout  |       |         |   |
| County:   | Knox  |       |         |   |
| Length:   | 0.69 Miles  |       |         |   |
| Date:   | August 14, 2020   |       |         |   |
| Estimate Type:  | Concept   |       |         |   |
| DESCRIPTION   |   |       |         |   |
|   | LOCAL   | STATE | FEDERAL | TOTAL   |
|   | 0%  | 0%    | 0%      |   |
| Construction Items                                    |   |       |         |   |
| Removal Items   | \$0   | \$0   | \$0     | \$1,070,000   |
| Asphalt Paving  | \$0   | \$0   | \$0     | \$1,530,000   |
| Concrete Pavement                                     | \$0   | \$0   | \$0     | \$0   |
| Drainage  | \$0   | \$0   | \$0     | \$532,000   |
| Appurtenances   | \$0   | \$0   | \$0     | \$588,000   |
| Structures  | \$0   | \$0   | \$0     | \$81,600  |
| Fencing   | \$0   | \$0   | \$0     | \$0   |
| Signalization & Lighting                              | \$0   | \$0   | \$0     | \$500,000   |
| Railroad Crossing                                     | \$0   | \$0   | \$0     | \$0   |
| Earthwork   | \$0   | \$0   | \$0     | \$1,310,000   |
| Clearing and Grubbing                                 | \$0   | \$0   | \$0     | \$0   |
| Seeding & Sodding                                     | \$0   | \$0   | \$0     | \$11,200  |
| Rip-Rap or Slope Protection                           | \$0   | \$0   | \$0     | \$0   |
| Guardrail   | \$0   | \$0   | \$0     | \$47,900  |
| Signing   | \$0   | \$0   | \$0     | \$5,700   |
| Pavement Markings                                     | \$0   | \$0   | \$0     | \$13,600  |
| Maintenance of Traffic                                | \$0   | \$0   | \$0     | \$110,000   |
| Mobilization 5%                                       | \$0   | \$0   | \$0     | \$290,000   |
| Other Items 10%                                       | \$0   | \$0   | \$0     | \$609,000   |
| Const. Contingency 30%                                | \$0   | \$0   | \$0     | \$1,990,000   |
| Const. Eng. & Inspec. 10%                             | \$0   | \$0   | \$0     | \$989,000   |
| Construction Estimate                                 | \$0   | \$0   | \$0     | \$9,680,000   |
| Interchanges & Unique Intersections                   |   |       |         |   |
| Roundabouts   | \$0   | \$0   | \$0     | \$1,200,000   |
| Interchanges  | \$0   | \$0   | \$0     | \$0   |
| Right-of-Way & Utilities                              |   |       |         |   |
|   | LOCAL   | STATE | FEDERAL | TOTAL   |
|   | 0%  | 0%    | 0%      |   |
| Right-of-Way  | \$0   | \$0   | \$0     | \$313,000   |
| Utilities   | \$0   | \$0   | \$0     | \$0   |
| Preliminary & Construction Engineering and Inspection |   |       |         |   |
| Prelim. Eng. 9%                                       | \$0   | \$0   | \$0     | \$1,000,000   |
| Total Project Cost (2018)                             | \$0   | \$0   | \$0     | \$ 12,200,000   |

# Life Cycle Cost – Roundabout 93% cost of Signal over 20 Year Design Life

| NCHRP 03-110 Life-Cycle Cost of Intersection Designs | Alternative 1 - Signal | Alternative 2 - Roundabout |
|--|------------------------|----------------------------|
| Planning & Construction Costs                        | \$ 10,300,000          | \$ 12,200,000              |
| Post-Opening Costs                                   | \$ -                   | \$ -                       |
| Auto Passenger Time                                  | \$ 28,415,276          | \$ 22,562,562              |
| Auto Passenger Reliability                           | --                     | --                         |
| Truck Time   | \$ 676,721             | \$ 537,336                 |
| Truck Reliability                                    | --                     | --                         |
| Transit Passenger Time                               | --                     | --                         |
| Transit Passenger Reliability                        | --                     | --                         |
| Bicyclist Time                                       | --                     | --                         |
| Pedestrian Time                                      | --                     | --                         |
| Safety   | \$ 14,831,008          | \$ 16,139,222              |
| Greenhouse Gases                                     | --                     | --                         |
| Criteria Pollutants                                  | --                     | --                         |
| <b>Total cost</b>                                    | <b>\$54,223,005</b>    | <b>\$50,539,120</b>        |

**NOTE:**  
Updated  
from Draft  
PowerPoint  
New Fatal  
vs. Injury  
Crash Data  
received  
from TDOT





# Interim Improvements

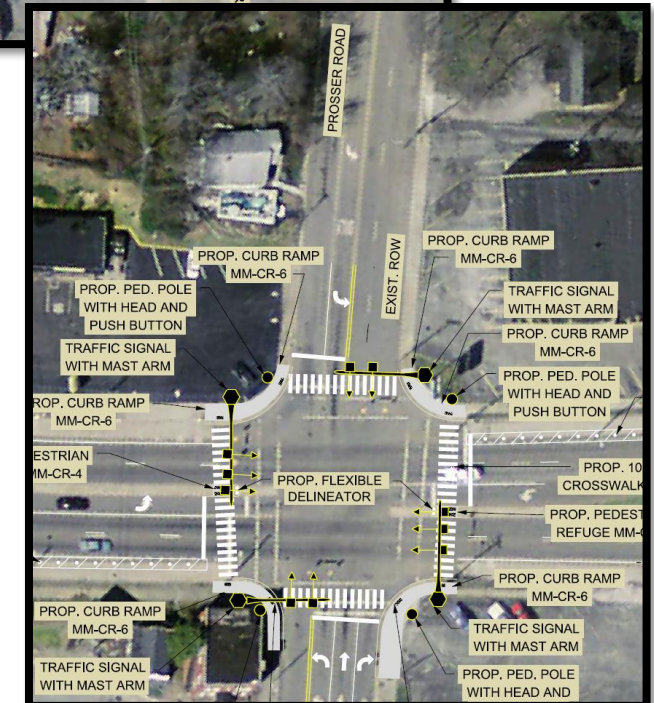
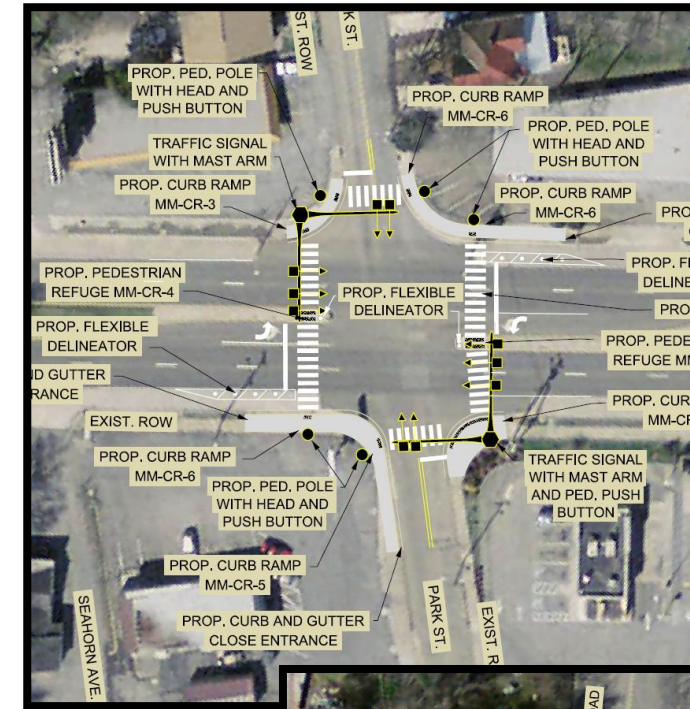
**TABLE 1: OPINION OF PROBABLE COST (NEAR-TERM IMPROVEMENT RECOMMENDATIONS)**

| #            | Description                                     | Cost            |
|--------------|---|-----------------|
| 1            | Install Curb Ramps at Seahorn Avenue (2)        | \$7,260         |
| 2            | Sidewalk Repairs near Seahorn Avenue (100-foot) | \$10,500        |
| 3            | Install Curb Ramps at Seahorn Avenue (2)        | \$7,260         |
| 4            | Sidewalk Repairs near Seahorn Avenue (100-foot) | \$10,500        |
| 5            | Install Curb Ramps at Shelby Street (2)         | \$7,260         |
| 6            | Install Curb Ramps near McCalla Avenue (2)      | \$7,260         |
| 7            | Sidewalk Repairs near Park Street (100-foot)    | \$10,500        |
| <b>Total</b> |   | <b>\$60,540</b> |

**TABLE 2: OPINION OF PROBABLE COST (INTERMEDIATE-TERM IMPROVEMENT RECOMMENDATIONS)**

| #            | Description   | Cost                      |
|--------------|---|---------------------------|
| 8            | Signalize the Park Street Intersection                                      | \$473,000                 |
|              | Curb Extensions and Crosswalk Improvements at the Park Street Intersection  | \$138,000                 |
| 9            | Curb Extensions at the Shelby Street Intersection (Concrete)                | \$10,500                  |
|              | Curb Extensions at the Shelby Street Intersection (Pavement Markings)       | \$3,820                   |
| 10           | Prosser Road Pedestrian Signal Improvements*                                | \$473,000                 |
|              | Curb Extensions and Crosswalk Improvements at the Prosser Road Intersection | \$174,000                 |
| <b>Total</b> |   | <b>Up to: \$1,268,500</b> |

\* Assume total signal replacement to relocate to metal poles separate from utilities



# Next Steps

City Concurrence  
TDOT Concurrence  
Public Engagement  
Final Document





# Questions?